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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,919	06/08/2005	Hajime Okutsu	273577US0PCT	6700

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
HAUTH, GALEN H	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
08/25/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/537,919	OKUTSU ET AL.	
	Examiner	Art Unit	
	GALEN HAUTH	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3,7,8,11,12 and 14-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3,7,8,11,12 and 14-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/19/2009 has been entered.

Response to Amendment

2. Applicant's amendment of claim 11 and the cancellation of claim 13 is acknowledged. No new matter has been added.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

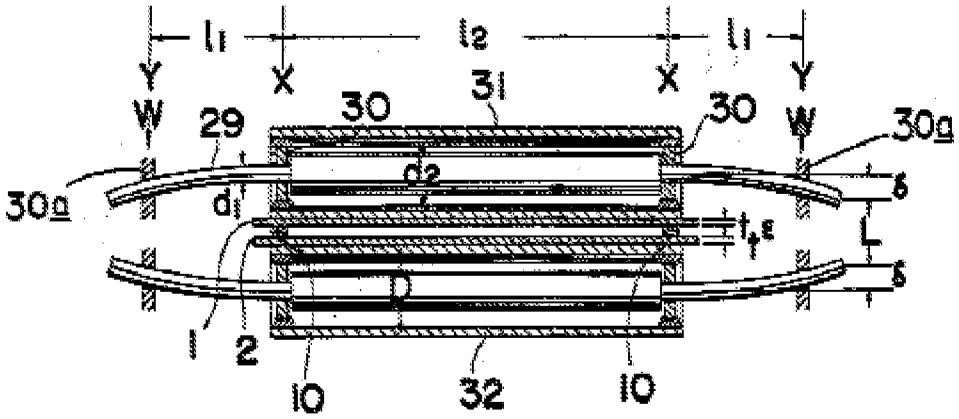
4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 2, 3, 8, 11-12, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (PN 3988098).

a. With regards to claim 11, Kato teaches a method for producing a sheet of polymer using two continuous belts surfaces with the polymerizable material in between the two belts (abstract). Kato teaches using methyl methacrylate (col 8 ln 64). Kato teaches using an apparatus in which two feed belts positioned in face to face relationship running in the same direction without relative displacement (at the same speed) with two gaskets in between them with a polymerizable material between the belts to produce a sheet at the end (abstract) in which polymerization is carried out by heating the polymerizable material (col 6 ln 27-34). The apparatus belts are supported by rollers with a diameter of 90 mm opposite each other in the polymerization zone (col 12 ln 30-35). Kato does not teach that the rollers have a diameter of 100 mm to 500 mm; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use rollers of 100 mm in optimization of the process. Kato teaches using rollers disposed in the polymerization section which are flexible (col 12 ln 30-33) as described in col 20 ln 46-68 – col 21 ln 1-26. As seen in figure 17 below, the flexibility provides both rollers with a crown shape to counteract the expansion forces of the gaskets and fluid polymer.

FIG.17



b. Kato teaches that all the rollers used are flexible in that these are the only rollers described to be involved in the polymerization zone (col 12 ln 30-33), and would therefor have greater than 4% of the rollers present in the described zone of the process with a crown shape (crown shape is interpreted to mean possessing a curvature). Kato teaches the use of crown shaped rollers throughout the polymerization process (col 12 ln 30-33). Due to the use of the rollers throughout the process the crown shaped rollers are taught to be present in the specified region of 30% to 90% of the total length of the polymerization zone from inlet to peak polymerization.

c. With regards to claim 2, Kato does not teach that the width of the belts are both 1800 mm or greater; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the width of

the belts to 1800 mm to achieve desired design specifications of the finished product.

d. With regards to claim 3, Kato teaches using rollers at 200 mm intervals (col 12 ln 33). Given the use of 500 mm diameter rollers as taught by Kato as applied to claim 1, Kato then teaches the use of a difference of 300 mm in [P-D].

e. With regards to claim 8, Kato teaches forming a product with a thickness variation of .1 mm (col 16 ln 15, given that the thickness variation is due to variation in the roll diameters, Kato thus teaches a tolerance of .1 mm in the diameter of the rolls.)

f. With regards to claims 12, 17, and 18, Kato as applied to claim 11 above teaches the use of crown shaped rollers throughout the polymerization process (col 12 ln 30-33). Due to the use of the rollers throughout the process the crown shaped rollers are taught to be present in the specified region of 30% to 90% of the total length of the polymerization zone from inlet to peak polymerization.

g. With regards to claims 16 and 19, Kato teaches the use of a mirror finished surface for the belts used (col 27 ln 15-17). Kato does not teach the degree of mirror finish in terms of surface roughness and pinhole diameter; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a surface roughness of less than 0.1 micrometers or .08 micrometers and pinhole diameters less than 250 micrometers to optimize the effects of the mirror finish in the process.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (PN 3988098) as applied to claim 11 above, and further in view of Whittum (PN 2732591).

a. With regards to claim 7, Kato ,as applied to claim 11 above, teaches a method for producing plate polymers using two continuous belts with roller pairs provided with a means for adjusting to the stress placed on them to produce a constant thickness across the material. Kato does not teach a roller that complies with the equation of claim 7, as it is understood that the equation of claim 7 corresponds to a shape similar to applicant's Fig. 2.

b. Whittum teaches a roll pair that may be employed to produce sheet material of uniform thickness under heavy pressure and temperature conditions made of plastic or resinous material (col 1 ln 15-26). Whittum teaches forming rolls as seen in Fig. 1-9 with a crown shape to deflect while under load to produce a part with uniform thickness (col 4 ln 21-47). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the crown rolls of Whittum in the process of Kato, because Whittum teaches that the rolls may be employed to produce sheet material of uniform thickness under heavy pressure and temperature conditions made of plastic or resinous material (col 1 ln 15-26). While Whittum does not teach all the elements of the equation of claim 7, Whittum teaches the same shape corresponding to the equation of claim 7 while acknowledging the necessity for compensating for stress applied to the roll during processing which causes the roll to flex. Therefor

it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a roll with specifications complying with the equation of 7 in the formation of a roll as taught by Whittum.

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (PN 3988098) as applied to claim 11 above, and further in view of Jensen et al. (PN 4636345).

a. With regards to claim 14, Kato teaches a method for producing a sheet of polymer using two continuous belts surfaces with the polymerizable material in between the two belts (abstract). Kato teaches using methyl methacrylate (col 8 ln 64). Kato teaches using an apparatus in which two feed belts positioned in face to face relationship running in the same direction without relative displacement (at the same speed) with two gaskets in between them with a polymerizable material between the belts to produce a sheet at the end (abstract) in which polymerization is carried out by heating the polymerizable material (col 6 ln 27-34). The apparatus belts are supported by rollers with a diameter of 90 mm opposite each other in the polymerization zone (col 12 ln 30-35). Kato does not teach that the rollers have a diameter of 100 mm to 500 mm; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use rollers of 100 mm in optimization of the process. Kato teaches that the sides of the rollers are fixed as seen in Figure 17 above. Kato does not teach that an upper roll axis of an upper roll is supported by a beam connected to a

spring which can be changed to adjust pressure applied by the roller to the material.

b. Jensen teaches a method for forming plastically deformable material with two continuous belts to produce a smooth uniform product (abstract). Jensen teaches that the belt supporting equipment can have compression springs attached that can be adjusted by adjusting the springs (col 10 ln 62-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply adjustable compression springs as taught by Jensen to the upper roll of the roller pair taught by Kato as both relate to double belt continuous processes. Given that the rollers taught by Kato are flexible the force applied from the springs taught by Jensen will cause deflection of the rollers which is also adjustable by changing the spring compression.

c. With regards to claim 15, Kato teaches using compression strength of 100 Kg/m (col 2 ln 36, 1 Kg/cm = 100 Kg/m).

8. In the event that applicant does not agree with the rejection of claims above due to interpretation of the claims, this secondary rejection below is presented.

9. Claims 2, 3, 7, 8, 11-12, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (PN 3988098) in view of Whittum (PN 2732591).

a. With regards to claim 11, With regards to claim 11, Kato teaches a method for producing a sheet of polymer using two continuous belts surfaces with the polymerizable material in between the two belts (abstract). Kato teaches using methyl methacrylate (col 8 ln 64). Kato teaches using an apparatus in

which two feed belts positioned in face to face relationship running in the same direction without relative displacement (at the same speed) with two gaskets in between them with a polymerizable material between the belts to produce a sheet at the end (abstract) in which polymerization is carried out by heating the polymerizable material (col 6 ln 27-34). The apparatus belts are supported by rollers with a diameter of 90 mm opposite each other in the polymerization zone (col 12 ln 30-35). Kato does not teach that the rollers have a diameter of 100 mm to 500 mm; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use rollers of 100 mm in optimization of the process. Kato teaches using rollers disposed in the polymerization section which are flexible (col 12 ln 30-33), but does not teach the use of a crown shaped roller body.

b. Whittum teaches a roll pair that may be employed to produce sheet material of uniform thickness under heavy pressure and temperature conditions made of plastic or resinous material (col 1 ln 15-26). Whittum teaches forming rolls as seen in Fig. 1-9 with a crown shape to deflect while under load to produce a part with uniform thickness (col 4 ln 21-47). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the crown rolls of Whittum in the process of Kato, because Whittum teaches that the rolls may be employed to produce sheet material of uniform thickness under heavy pressure and temperature conditions made of plastic or resinous material (col 1 ln 15-26).

c. Kato teaches that all the rollers used are flexible in that these are the only rollers described to be involved in the polymerization zone (col 12 ln 30-33), and would therefor have greater than 4% of the rollers present in the described zone of the process with a crown shape as taught by Whittum. Kato in view of Whittum teaches the use of crown shaped rollers throughout the polymerization process (col 12 ln 30-33 of Kato). Due to the use of the rollers throughout the process the crown shaped rollers are taught to be present in the specified region of 30% to 90% of the total length of the polymerization zone from inlet to peak polymerization.

d. With regards to claim 2, Kato does not teach that the width of the belts are both 1800 mm or greater; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the width of the belts to 1800 mm to achieve desired design specifications of the finished product.

e. With regards to claim 3, Kato teaches using rollers at 200 mm intervals (col 12 ln 33). Given the use of 500 mm diameter rollers as taught by Kato as applied to claim 1, Kato then teaches the use of a difference of 300 mm in [P-D].

f. With regards to claim 7, While Whittum does not teach all the elements of the equation of claim 7, Whittum teaches the same shape corresponding to the equation of claim 7 while acknowledging the necessity for compensating for stress applied to the roll during processing which causes the roll to flex. Therefor it would have been obvious to one of ordinary skill in the art at the time the

invention was made to provide a roll with specifications complying with the equation of 7 in the formation of a roll as taught by Whittum.

g. With regards to claim 8, Kato teaches forming a product with a thickness variation of .1 mm (col 16 ln 15, given that the thickness variation is due to variation in the roll diameters, Kato thus teaches a tolerance of .1 mm in the diameter of the rolls.)

h. With regards to claims 12, 17, and 18, Kato as applied to claim 11 above teaches the use of crown shaped rollers throughout the polymerization process (col 12 ln 30-33). Due to the use of the rollers throughout the process the crown shaped rollers are taught to be present in the specified region of 30% to 90% of the total length of the polymerization zone from inlet to peak polymerization.

i. With regards to claims 16 and 19, Kato teaches the use of a mirror finished surface for the belts used (col 27 ln 15-17). Kato does not teach the degree of mirror finish in terms of surface roughness and pinhole diameter; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a surface roughness of less than 0.1 micrometers or .08 micrometers and pinhole diameters less than 250 micrometers to optimize the effects of the mirror finish in the process.

10. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (PN 3988098) in view of Whittum (PN 2732591) as applied to claim 11 above, and further in view of Jensen et al. (PN 4636345).

a. With regards to claim 14, Kato in view of Whittum teaches a method for producing a sheet of polymer using two continuous belts surfaces with the polymerizable material in between the two belts (abstract). Kato teaches using methyl methacrylate (col 8 ln 64). Kato teaches using an apparatus in which two feed belts positioned in face to face relationship running in the same direction without relative displacement (at the same speed) with two gaskets in between them with a polymerizable material between the belts to produce a sheet at the end (abstract) in which polymerization is carried out by heating the polymerizable material (col 6 ln 27-34). The apparatus belts are supported by rollers with a diameter of 90 mm opposite each other in the polymerization zone (col 12 ln 30-35). Kato does not teach that the rollers have a diameter of 100 mm to 500 mm; however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use rollers of 100 mm in optimization of the process. Kato teaches that the sides of the rollers are fixed as seen in Figure 17 above. Kato does not teach that an upper roll axis of an upper roll is supported by a beam connected to a spring which can be changed to adjust pressure applied by the roller to the material.

b. Jensen teaches a method for forming plastically deformable material with two continuous belts to produce a smooth uniform product (abstract). Jensen teaches that the belt supporting equipment can have compression springs attached that can be adjusted by adjusting the springs (col 10 ln 62-67). It would have been obvious to one of ordinary skill in the art at the time the invention was

made to apply adjustable compression springs as taught by Jensen to the upper roll of the roller pair taught by Kato as both relate to double belt continuous processes. Given that the rollers taught by Kato are flexible the force applied from the springs taught by Jensen will cause deflection of the rollers which is also adjustable by changing the spring compression.

c. With regards to claim 15, Kato teaches using compression strength of 100 Kg/m (col 2 ln 36, 1 Kg/cm = 100 Kg/m).

Response to Arguments

11. Applicant's arguments filed 06/19/2009 have been fully considered but they are not persuasive.

With regards to applicant's arguments that the interpretation of the rolls of Kato not having a crown shaped lower roll body are not persuasive as the broadest interpretation of the limitation does not preclude the definition taken by the examiner. With regards to applicant's arguments that Whittum does not teach that the shape of the top roll and bottom roll are different, this argument is not found persuasive in that the limitations argued by the applicant are not reflected in the claims. With regards to applicant's arguments that the references fail to teach the 30 to 90 % district of rolls, this argument is not persuasive as Kato teaches using the rollers throughout the entire process which would include the specified region.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GALEN HAUTH whose telephone number is (571)270-5516. The examiner can normally be reached on Monday to Thursday 8:30am-5:00pm ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571)272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GHH/

/Christina Johnson/
Supervisory Patent Examiner, Art Unit 1791